Tree Care During Drought

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Periods of drought are not uncommon on Colorado’s Front Range. Growing trees in a naturally semi-arid prairie landscape is challenging enough, without the rigors of an extended drought to deal with. This makes growing healthy trees in our region all the more challenging and helps us realize the value of a majestic shade tree. Properly placed and maintained trees are an asset to the environment and to our community. Learn more about the benefits of trees.

- What does a tree under “drought stress” look like ?

- Where do I water my tree ?

- Tree Watering: Amount of water needed and methods to use during watering restrictions.

- Understanding tree roots

- How to preserve tree health when water restrictions are in place ?

- How do I prioritize watering needs for different types of trees ?

- Drought tolerant trees to consider

- Do I need to water my tree in the winter ?

What does a tree under “drought stress” look like ?

Symptoms of drought injury to trees can be sudden or may take up to two years to be revealed. Often times, drought stress may not kill a tree outright, but set it up for more serious secondary insect and disease infestations in following years.

- Drought injury symptoms on tree leaves include wilting, curling at the edges, and yellowing.

- Deciduous leaves may develop brown outside edges or browning between veins.

- Evergreen needles may turn yellow, red or purple or turn brown from the tip downward.

- In continued drought, leaves may be smaller than normal, drop prematurely or remain attached to the tree even though brown.

brown leaf edges brown needles

wilting leaves

<Back to Top>

Where do I water my tree ?

- Deep watering to a depth of 12 - 18 inches below the soil surface is recommended.

- Saturate the soil around the tree within the “dripline” (the outer edges of the tree’s branches) to disperse water down toward the roots.

- For evergreens, water 3’-5’ beyond the dripline on all sides of the tree.

- The objective is to water slowly, dispersing the flow of water to get the water deep down to the trees roots. Watering for short periods of time only encourages shallow rooting which can lead to more drought damage.

- Don’t dig holes in the ground in an effort to water deeply. This dries out roots even more. A soil needle/deep root feeder attached to a hose is acceptable to insert into the ground if your soil is not too hard and compact.

- Overhead spraying of tree leaves is inefficient and should be avoided during drought conditions.

<Back to Top>

Tree Watering: Amount of water needed and methods to use during watering restrictions.

During the drought, trees must be given top watering priority over your lawn. However, caring for trees requires different watering methods than your lawn. During water restrictions, irrigation systems designed to water turf does not sufficiently water your trees.

- How much water your tree should receive depends upon the tree size. A general rule of thumb is to use approximately 10 gallons of water per inch of trunk diameter for each watering. Measure trunk diameter at knee height. General formula: Tree Diameter x 5 minutes = Total Watering Time.

- Example: When you hand water using a hose at medium pressure, it will take approximately 5 minutes to produce 10 gallons of water. If you have a 4” diameter tree, it should receive 40 gallons of water - multiply by 5 minutes to equal total watering time of 20 minutes.

- All size trees should be watered May through September according to the guidelines below. All trees should also receive adequate water during the winter months too –For more information on winter watering, see below.

- Water should be distributed evenly on all four sides and under the dripline of the tree.

The best watering method depends upon whether you have a small (1-7” diameter), medium (8-15” diameter) or large sized (16”+ diameter) tree.

Small Trees (1-7” diameter) - water once per week

Newly planted and smaller trees can get adequate water within the existing watering restrictions by hand watering with a spray hose attachment for 15 minutes as a separate zone on your designated day.

Small trees are best watered using the following methods:

- Automated drip irrigation system/soaker hose (water for approximately 2 hours)

- End of the hose (without any attachments) at medium pressure

- 5-gallon bucket (with _” holes drilled in bottom) – filled and set under dripline.

5-gallon bucket method

Soaker hose method

Medium Trees (8-15” diameter) – water three times per month

Take advantage of “TLC (Tender Loving Care) for Your Tree Day” to give supplemental water to your

medium and larger sized trees. For more on TLC day

Medium sized trees are best watered using the following methods:

- Soaker hose coiled several times under the dripline of the tree (water for approximately 2 hours)

- End of the hose with a shower like hose attachment to disperse the flow – use a medium pressure.

- Soil needle at end of hose.

- 5-gallon buckets (with _” holes drilled in bottom) – filled and set under dripline

Hose with shower attachment

Hose with soil needle

Large Trees (16”+ diameter) - water twice per month

- Take advantage of “TLC (Tender Loving Care) for Your Tree Day” to give supplemental water to your medium and larger sized trees.

- Healthy mature trees should be able to withstand a short-term drought. Watering once per month will ensure that your tree gets adequate water.

- Large trees are best watered using the following method:

- End of the hose with a shower like hose attachment to disperse the flow – use a medium pressure.

- Soil needle at end of hose.

Use This Watering Chart (194.01 KB) When Lawn Watering Is Prohibited.

- Additional Watering Tips…

- Reuse the water you save waiting for the shower to warm up.

- If you drain your kids’ pools, pour the water under a tree.

- Redirect your rain gutters toward your trees.

- Adopt a tree! Water a tree in the median or right-of-way that may not be receiving water !

<Back to Top>

Understanding tree roots

Most people do not understand what their trees’ root system looks like. Tree root system consist of large perennial roots and smaller, short-lived, feeder roots. The large, woody tree roots and their primary branches increase in size and grow horizontally. At least 90% are located in the top 12-18” inches of the soil. Root functions include water and mineral conduction, food and water storage, and anchorage.

In contrast, feeder roots, although averaging only 1/16 inch in diameter, constitute the major portion of the root system's surface area. These smaller roots grow outward and predominantly upward from the large roots near the soil surface, where minerals, water and oxygen are relatively abundant. The major function of feeder roots is the absorption of water and minerals.

Large roots and small feeder roots occupy a large area under ground. Typically, the root system of a tree extends outward well past the dripline, up to two to four times the height of the tree.

<Back to Top>

How to preserve tree health when water restrictions are in place ?

Listed below are tree maintenance procedures that can significantly increase a tree’s chance of making it through drought periods.

- Mulch around your trees with 3-4 inches of organic mulch to reduce moisture loss.

- Use wood chips, shredded bark, or pine needles as mulch – avoid the use of stone or rock near trees as this increases air temperatures and moisture loss from leaves and stems.

- Avoid mounding the mulch up against the tree trunk.

- Do not fertilize a tree that is under drought stress. Salts in fertilizer may burn roots when there is not sufficient water. Fertilizers may also stimulate top growth resulting in too much leaf area on the plant for the root system to maintain during periods of limited soil moisture.

- Keep your trees healthy and pest free. Postpone any construction activities planned near your tree to reduce impact to the trees’ roots. If your tree has any insect or disease problem that may be adding additional stress – treat them accordingly to reduce the overall stress to your trees. For most insect problems found in Boulder, biological controls or lower toxicity pesticides can be used.

- Properly prune trees and shrubs during time of drought to improve structure, limb stability and to remove dead and weakened branches. Leaving broken, dead, insect-infested or diseased branches can further weaken a tree during drought and set the tree up for deadly secondary insect and disease problems.

- Many tree species are harmed by herbicides used in the lawn. Trees already stressed by drought can be harmed by a heavy application of herbicide in the root zone.

- Following these guidelines will help preserve our trees, the most valuable assets to our landscapes, and will also meet guidelines for water conservation during drought periods.

Use mulch to conserve water

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<Back to Top>

How do I prioritize watering needs for different types of tree ?

- 1. The first trees to consider watering are those that will be most vulnerable and affected by dry conditions. Newly planted and young trees (1-7” diameter) are not yet established and have a limited root system. These trees generally need supplemental water even when we are not experiencing drought conditions.

- Trees growing within a restricted root zone. Examples are trees adjacent to a driveway or house, growing within a landscape strip between your sidewalk and the street, growing in a median or traffic circle.

- Trees that have recently received root injury due to construction work will need supplemental watering because the root system has been compromised.

- 2. Next to consider are the trees that are generally better equipped to withstand drought conditions.

- In continued dry conditions even older trees will start to show symptoms of drought stress and will need supplemental water although less frequently than younger trees.

- Established drought tolerant species may also need supplemental watering with continued drought.

- Volunteer trees (self-seeded) or “weed” trees typically have extensive root systems and need less water.

<Back to Top>

Drought tolerant trees to consider

Deciduous Trees:

- Catalpa (large maturing)
- Goldenrain tree (small maturing)
- Hackberry (medium to large maturing)
- Honeylocust (medium to large maturing)
- Kentucky coffeetree (large maturing)
- Maple, Amur (small maturing)
- Maple, Wasatch (small maturing)
- Oak, Bur (large maturing)
- Ohio buckeye (medium maturing)

Evergreen Trees:

- Pine, Austrian (large maturing)
- Pine, Pinyon (medium maturing)
- Pine, Ponderosa (large maturing)
- Pine, Scotch (large maturing)

Even if a tree is drought tolerant, it still needs to be watered the first few years and then watering can be reduced.

Back to Top

Do I need to water my tree in the winter ?

Even in years when drought is not a concern – winter watering is crucial, especially with evergreen trees! Well-timed fall and winter watering may allow a tree to survive on less water than a regime of plentiful water applications during the growing season. Tree roots continue to grow throughout the winter and need moisture to survive. Generally, water once per month on a warm day when the ground is not frozen.

Back to Top

back to Urban Forestry main page